

REMARKS

Claims 1 to 45 are pending in the application, of which claims 1, 7, 13, 19, 25, 29, 31, 36 and 41 are the independent claims. Favorable reconsideration and further examination are respectfully requested.

Initially, Applicants thank the Examiner for the indication that claims 7, 8, 11, 12, 19, 20, 23, 24, 29 and 30 are allowable and for the indication that claims 2 to 5, 9, 10, 14 to 17, 21, 22 and 26 to 28 contain allowable subject matter.

Rather than rewriting claims 2, 14 and 26 into independent form, Applicants present new claims 31, 36 and 41, which are drawn along the lines of the unamended independent claims and which contain subject matter from allowable dependent claims 2, 14 and 26. Specifically, new independent claim 31 is roughly equivalent to unamended claims 1 and 2; new independent claim 36 is roughly equivalent to unamended claims 13 and 14; and new independent claim 41 is roughly equivalent to unamended claims 25 and 26. The newly-presented claims have been written with the various formal objections and rejections in the Office Action in mind. The remarks below, particularly the 35 U.S.C. §112, first paragraph, remarks, apply to the new claims as well.

In the Office Action, the drawings were objected to for the reasons noted on page 2. Applicants respectfully traverse these rejections as follows.

With respect to objection (a), Applicants submit that an example of the "third location" is labeled as 31 in Fig. 5. An example of the first location is labeled 24 in Figs. 3 and 5 and an example of the second location is labeled 25 in Fig. 3. With respect to objection (b), an example of the computer program of claim 11 is device driver 15 of Fig.

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1. Examples of "instructions" in the claims include computer software (which necessarily contains executable instructions, as indicated in page 11 of the specification), such as device driver 15 and DMA engine 16. With respect to objection (c), an example of the database is scatter/gather list 26. With respect to objection (d), as noted, examples of "instructions" include device driver 15 and DMA engine 16. With respect to objection (e), an example of the "predetermined portion of the data" is demand data 24 in Figs. 3 and 5. With respect to objection (f), scatter/gather list 26 is depicted in Fig. 1.

In view of the foregoing remarks, withdrawal of the objection to the drawings is respectfully requested.

Claim 6 was objected to for containing an improper dependency. The dependency of claim 6 has been changed, as shown above. Accordingly, withdrawal of the objection to claim 6 is respectfully requested.

The disclosure was objected to for the reasons noted on page 3 of the Office Action. Objections (a), (b), (e), (f), and (g) have been addressed by the amendments to the specification noted above. No new matter has been entered. With respect to objection (c), Applicants note that host processing device 11 may take the form of any type of machine capable of executing instructions to perform processes 19 and 30. As described on page 8, lines 10 to 13, the host processing device may be a controller 36 in Fig. 7. Alternatively, it may be a more powerful type of computer, such as a PC. With respect to objection (d), Applicants submit that "prior point relative to the demand data on hard disk 12" can mean any point that precedes the demand data in a direction of motion of hard disk 12, including

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those points that are not adjacent to the demand data. This is believed to be clear based on preceding lines 3 et seq. of page 7.

In view of the foregoing amendments and remarks, withdrawal of the objections to the specification is respectfully requested.

Claims 9, 10, 18, 21 and 22 were rejected under the first paragraph of §112 for allegedly failing to be enabled by the specification. Specifically, it was said that the specification does not provide teaching for reading three locations in response to a single command. Applicants respectfully disagree and point to page 2, lines 1 to 3 which specifically indicate that more than two locations can be read using a single command ("Thus, data from two (or more) locations of the storage medium can be read and processed separately using a single "read" command") (emphasis added). Applicants further point to page 7, lines 20 et seq. which indicates that preceding and succeeding prefetch data may be read by process 30 (i.e., in response to a single command). Nevertheless, solely to advance prosecution, Applicants have removed the "in response to the command" language from the claims directed to reading data from a third storage location. The new claims have also been written along these lines.

Claims 13 to 18 and 25 to 28 were also rejected under the first paragraph of §112 for allegedly failing to be enabled by the specification. Specifically, it was said that there was no support in the specification for the claims' feature of issuing an interrupt after storage of a predetermined portion of data. Applicants respectfully traverse this rejection.

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Applicants agree with the Examiner that there is support for issuing the interrupt after processing a scatter/gather list entry. But, Applicants submit that this occurs, and is described in the specification as occurring, after the demand data has been stored. For example, page 5, lines 16 et seq. reads as follows:

As DMA engine 16 finishes with the demand data, it encounters this entry in scatter/gather list 26. When it encounters this entry, DMA engine 16 issues (204) an interrupt to signal the boundary between the demand and prefetch data. The interrupt is provided to device driver 15 which, in response, informs other processes (not shown) executing on host processing device 11 that the demand data has been read/stored. (emphasis added)

This portion of the specification indicates that the interrupt is issued when the DMA engine finishes storing the demand data. That is, the interrupt indicates to the device driver that the demand data has been "read/stored" and, in response, the device driver informs other processes on host processing device 11. Thus, Applicants submit that the specification does provide an enabling disclosure for issuing an interrupt after a predetermined portion of data (e.g., demand data) has been stored.

In view of the foregoing amendments and remarks, withdrawal of the §112, first paragraph, rejections is respectfully requested.

Turning now to the art rejection, claims 1, 13 and 25 were rejected under §102(b) over U.S. Patent No. 5,473,761 (Parks). As shown above, Applicants have amended claims 1, 13 and 25 to clarify the invention. In view of these clarifications, reconsideration and withdrawal of the art rejection are respectfully requested.

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Amended independent claim 1 defines a method of reading data from a storage medium. The method includes reading data on the storage medium in response to a command, the data comprising prefetch data and demand data, storing the demand data in a region of memory, and issuing an interrupt after the demand data has been stored in memory.

The applied art is not understood to disclose or to suggest the foregoing, particularly issuing an interrupt after demand data has been stored in memory. More specifically, it is true that Parks describes issuing an interrupt after data from a read operation is stored in memory. However, Parks does not describe reading both prefetch and demand data from a storage medium and issuing the interrupt after the demand data has been stored. Parks does describe prefetching operations; however, not in the context of issuing an interrupt after demand data has been stored. Accordingly, claim 1 is believed to be patentable over Parks.

Amended independent claim 13 is a readable medium claim that roughly corresponds to claim 1; and amended independent claim 25 is an apparatus claim that roughly corresponds to claim 1. These claims are also believed to be in condition for allowance for at least the reasons noted above.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

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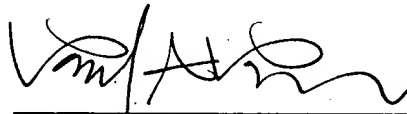
Applicants : Knut S. Grimsrud, et al.
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Page : 15

Attorney Docket No.: 10559/111001/P7645

Enclosed is a check for \$522 to cover the additional claims. Please apply any other charges or credits to Deposit Account No. 06-1050. Applicants' undersigned attorney can be reached at the address shown below. Telephone calls regarding this application should be directed to the undersigned at 617-521-7896.

Respectfully submitted,

Date: June 28, 2002



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the specification as follows:

Please replace page 3, lines 14 to 16 with the following:

- -engine consults a table, such as scatter/gather list 26 [27], to determine
where in memory 17 to store the received data. Scatter/gather list 26 [27]
includes lists of addresses in memory- -

Please replace page 5, lines 9 to 12 with the following:

- -the size of the blocks of data. However, the frequency is such that DMA
engine 16 consults scatter/gather list 26 when DMA engine 16 reaches [at]
(or comes substantially near to) a boundary between the demand and prefetch
data (as that data is read).- -

Please replace page 7, lines 11 to 13 with the following:

- -Generally speaking, it does not take additional time to read data 31, since
[the location of demand data 24 is moved to] transducer head 22 is moved
past data 31 in order [anyway] to read demand data 24.- -

Please replace page 7, lines 22 to 23 with the following:

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--401. Thus, a single command can be used to read both prefetch and demand data. Process 30 may also read prefetch data- -

Please replace page 8, line 2 with the following:

- -data, or the prefetch data may be read using host processing device- -

IN THE CLAIMS:

Please amend the claims as follows:

- -1. (Amended). A method of reading data from a storage medium, comprising:
reading data on the storage medium in response to a command, the data comprising prefetch data and demand data;
storing the demand data in a region of memory; and
issuing an interrupt after [a predetermined portion of] the demand data has been stored in memory.

5. (Amended) The method of claim 1, wherein the demand [predetermined portion of] data is read from a first location on the storage medium and the prefetch [additional] data is read from a second location on the storage medium, the first location preceding the second location in a direction of movement of the storage medium during reading.

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6. (Amended) The method of claim 5 [6], further comprising reading additional prefetch data from a third location on the storage medium [in response to the command], the third location preceding the first and second locations in a direction of movement of the storage medium during reading.

9. (Amended) The method of claim 7, further comprising reading data from a third location on the storage medium [in response to the command], the third location following the second location in the direction of movement of the storage medium during reading.

13. (Amended) A machine-readable [computer program stored on a computer-readable] medium that stores instructions to read [for reading] data from a storage medium, the [computer program comprising] instructions causing a machine [that cause a computer] to:

read data on the storage medium in response to a command, the data comprising prefetch data and demand data;

store the demand data in a region of memory; and

issue an interrupt after [a predetermined portion of] the demand data has been stored in memory.

14. (Amended) The machine-readable medium [computer program] of claim 13, further comprising instructions that cause the machine [computer] to consult a database to determine when to issue the interrupt.

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15. (Amended) The machine-readable medium [computer program] of claim 14, wherein the database comprises instructions for storing the data and for issuing the interrupt.

16. (Amended) The machine-readable medium [computer program] of claim 14, wherein the database comprises a scatter/gather list.

17. (Amended) The machine-readable medium [computer program] of claim 13, wherein [the predetermined portion of] the demand data is read from a first location on the storage medium and the prefetch [additional] data is read from a second location on the storage medium, the first location preceding the second location in a direction of movement of the storage medium during reading.

18. (Amended) The machine-readable medium [computer program] of claim 17, further comprising instructions that cause the machine [computer] to read additional prefetch data from a third location on the storage medium [in response to the command], the third location preceding the first and second locations in a direction of movement of the storage medium during reading.

21. (Amended) The computer program of claim 19, further comprising instructions [instruction] that cause the host processing device to read data from a third

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location on the storage medium [in response to the command], the third location following the second location in the direction of movement of the storage medium during reading.

25. (Amended) An apparatus for reading data from a storage medium, comprising:
a memory which stores computer instructions; and
a processor which executes the computer instructions to (i) read data on the storage medium in response to a command, the data comprising prefetch data and demand data, (ii) store the demand data in a region of memory, and (iii) issue an interrupt after [a predetermined portion of] the demand data has been stored in memory.

28. (Amended) The apparatus of claim 25, wherein the demand [predetermined portion of] data is read from a first location on the storage medium and the prefetch [additional] data is read from a second location on the storage medium, the first location preceding the second location in a direction of movement of the storage medium during reading.--

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